

Utah Lake Water Quality Study: Steering Committee Meeting #1



January 4, 2018

*Division of Water Quality
Utah Department of Environmental Quality*

Overview of Why We're Here Part I

Setting the Context: Why does DWQ do what it does?



What is Water Quality?

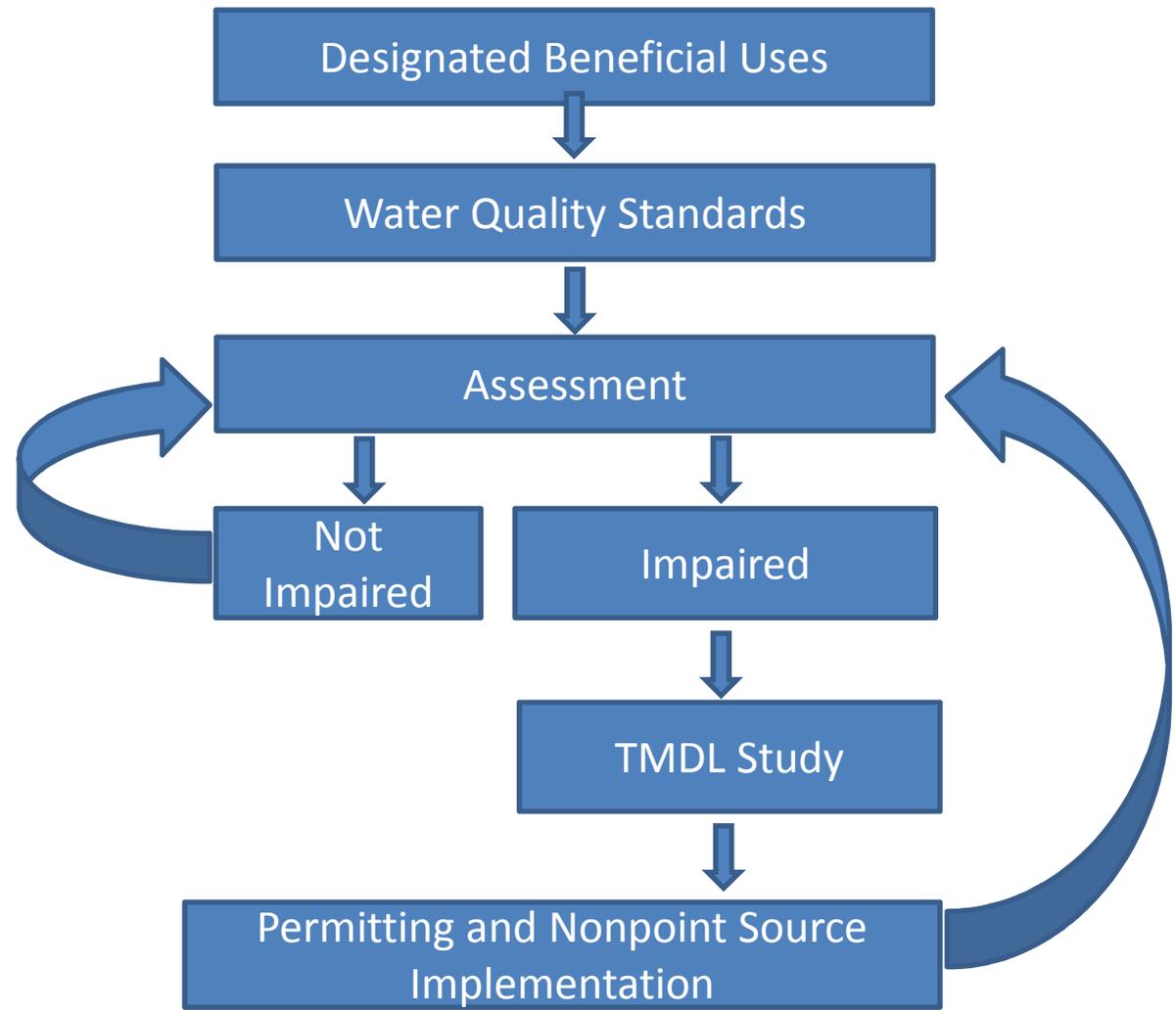


....a measure of the condition of water relative to the requirements of one or more biotic species and or to any human need or purpose.

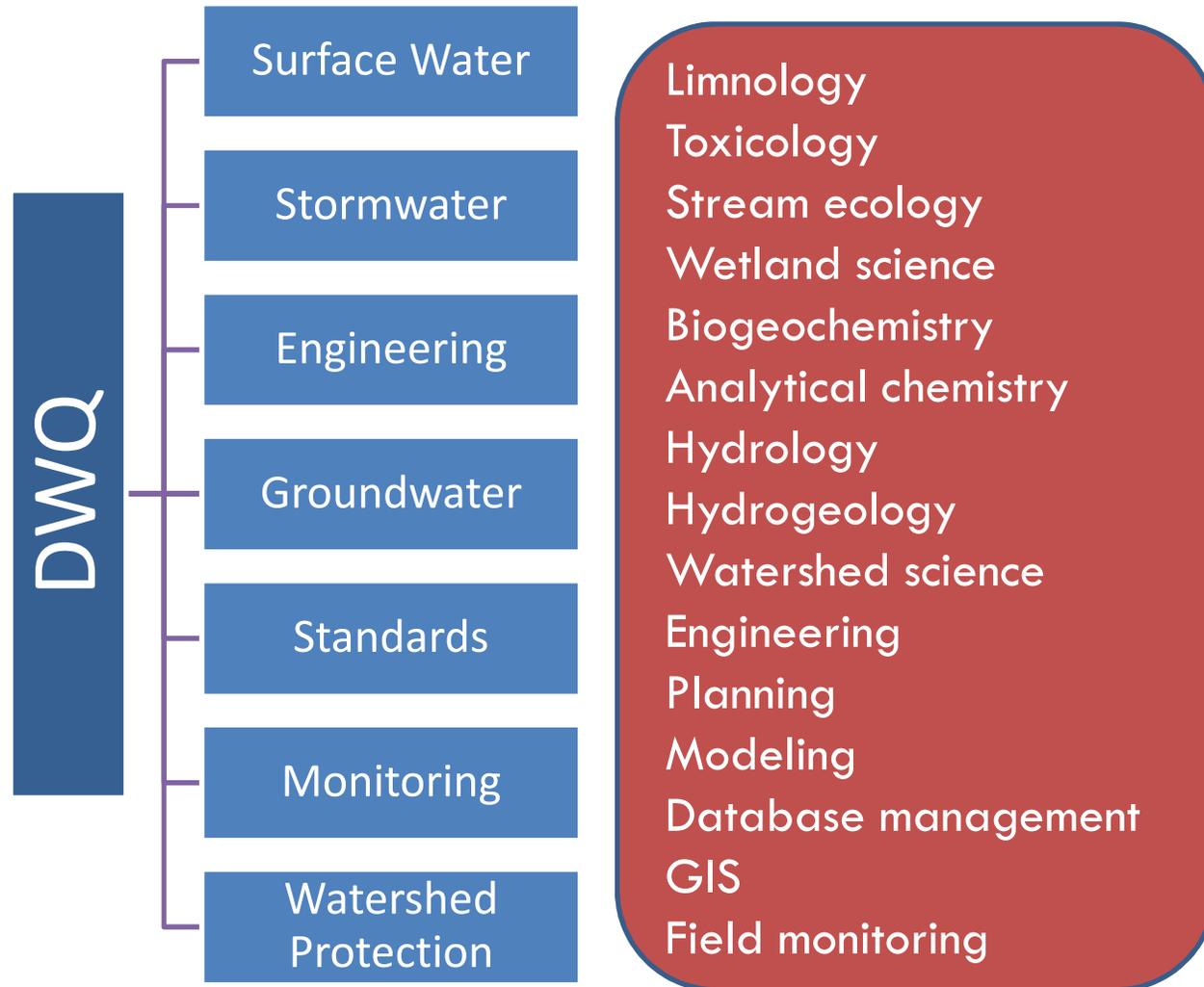
Utah's Regulatory Authority to Protect and Restore Water Quality

Clean Water Act Sections 303, 304, 305, and 402 (among others) → Delegated from EPA to State of Utah, DEQ

Utah Water Quality Act (Title 19-5) outlines Powers of Water Quality Board and Director of Division of Water Quality



Division of Water Quality



Utah Water Quality Board

Mission

- Guide the development of water quality policy and regulation in the state.

Members

- Appointed by the governor (consent of senate).
- Makeup is defined by statute, and is designed to represent various interest groups of the water quality community (Utah Code Section 19-5-103).

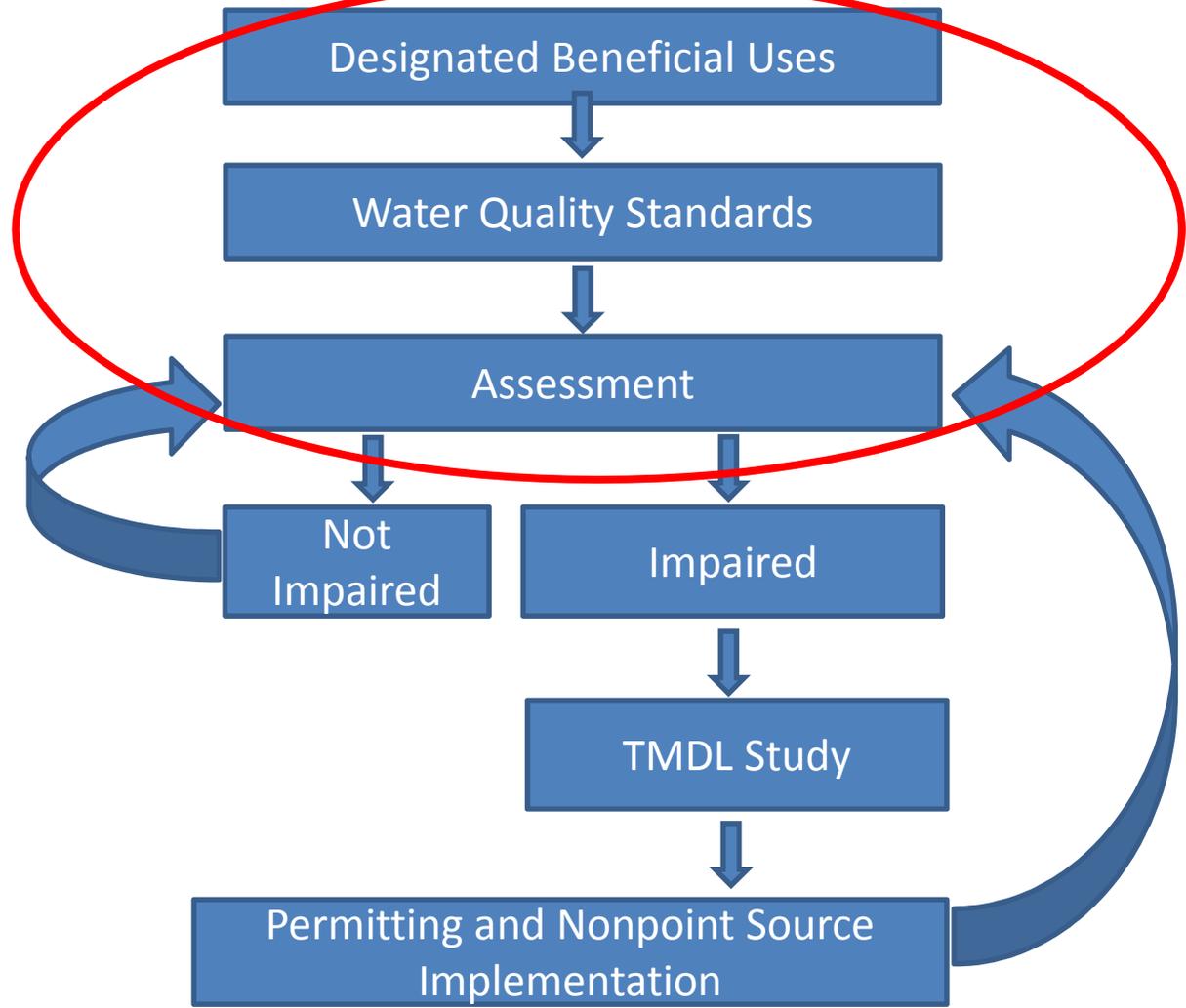
Myron E. Bateman, Chair		
360 Kingston Drive Tooele, Utah 84074	Non-Federal Government Republican First Appointed: 05/25/2011 Term Ends: 03/01/2019	
Clyde L. Bunker		
1670 N. Jones Road Delta, Utah 84624	Agriculture and Livestock Republican First Appointed: 05/01/2011 Term Ends: 03/01/2019	
Steven K. Earley		
210 N. 400 E. Centerville, UT 84014	Non Government Organization Republican First Appointed: 5/20/2015 Term Ends: 3/01/2019	
Gregg Alan Galecki		
PO Box 203 Fairview, UT 84629	Mineral Industry Republican First Appointed: 03/01/2013 Term Ends: 06/21/2021	
Jennifer M. Grant		
4700 Daybreak Parkway South Jordan, UT 84095	Manufacturing Industry Independent First Appointed: 03/01/2013 Term Ends: 06/21/2021	
Michael Luers		
2800 Homestead Road Park City, UT 84098	Special Service Dist. Independent First Appointed: 5/20/2015 Term Ends: 3/01/2019	
Alan Matheson		
Department of Environmental Quality 195 North 1950 West P.O. Box 144810 Salt Lake City, UT 84114-4810	Executive Director Department of Environmental Quality Independent	
David C. Ogden		
75 East Center Street Richfield Ut. 84701	Non-Federal Government First Appointed: 8/23/2017 Term Ends: 8/31/2021	
Jim VanDerslice, PhD		
375 University of Utah Salt Lake City, UT 84108	Non-Federal Government Independent First Appointed: 03/01/2016 Term Ends: 06/21/2021	



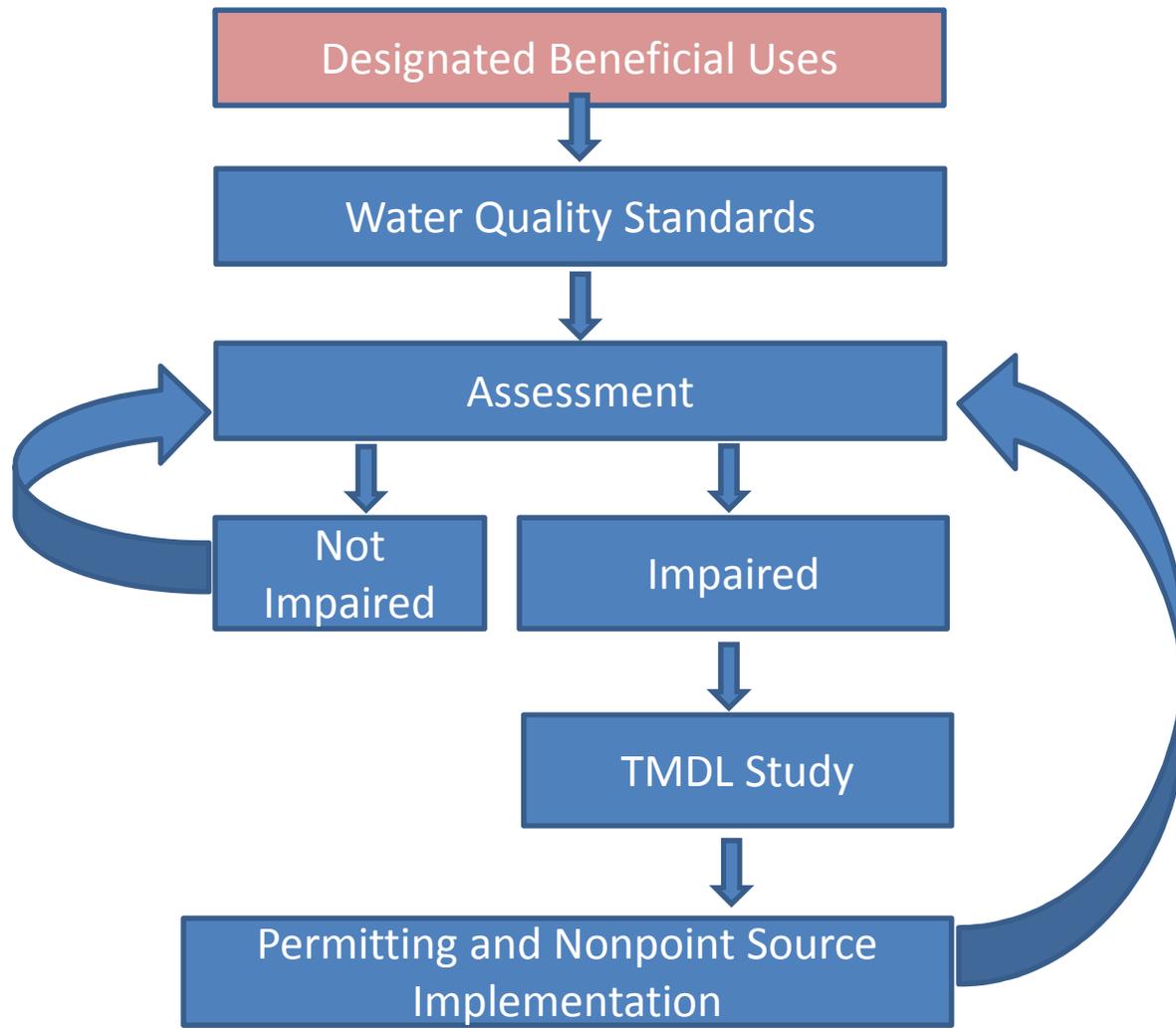
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Designated Beneficial Uses



Statewide Uses Designations (R317-6)

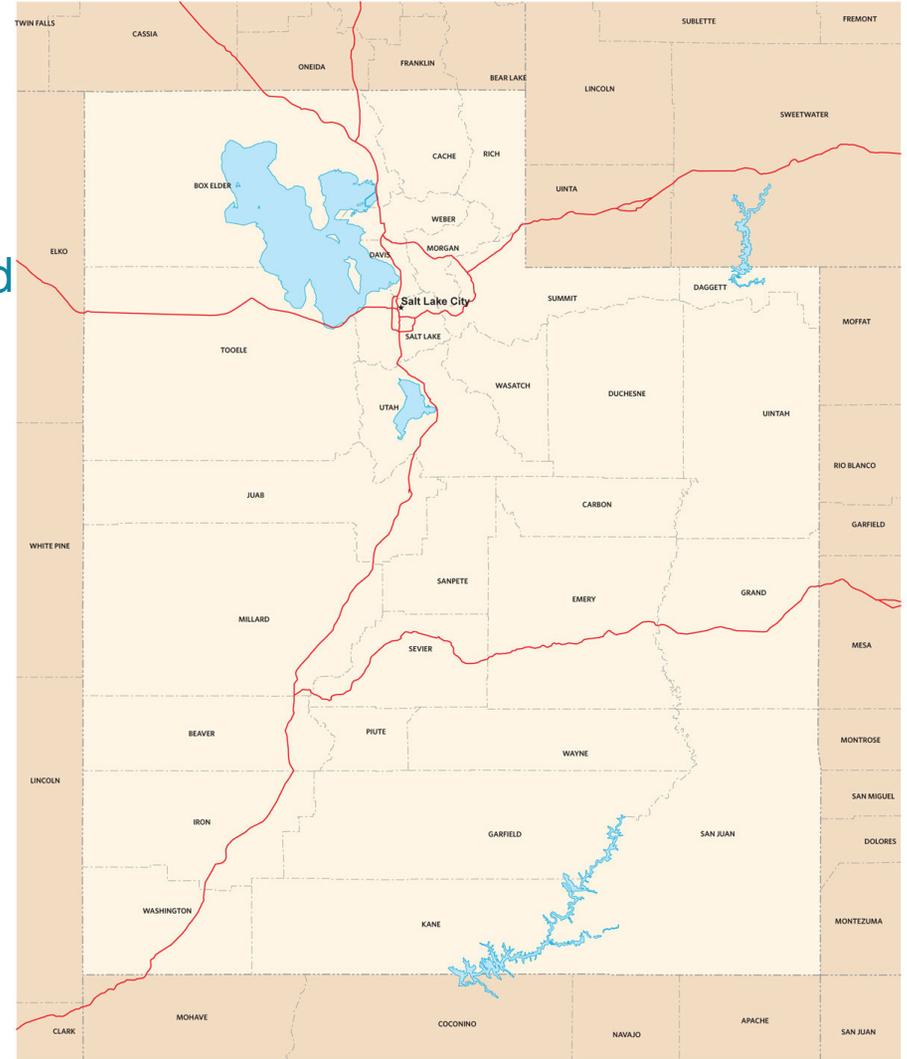
Class 1 -- Protected for use as a raw water source for domestic water systems

Class 2 -- Protected for recreational use and aesthetics.

Class 3 -- Protected for use by aquatic wildlife.

Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.

Class 5 -- The Great Salt Lake.



Classification of Waters of the State (R317-2-13)

All Utah waters are classified

Lakes and Reservoirs (Section 13.12)

- lakes and reservoirs greater than 10 acres not listed in 13.12 are assigned by default to the classification of the stream with which they are associated.

13.13 Unclassified Waters (Section 13.13)

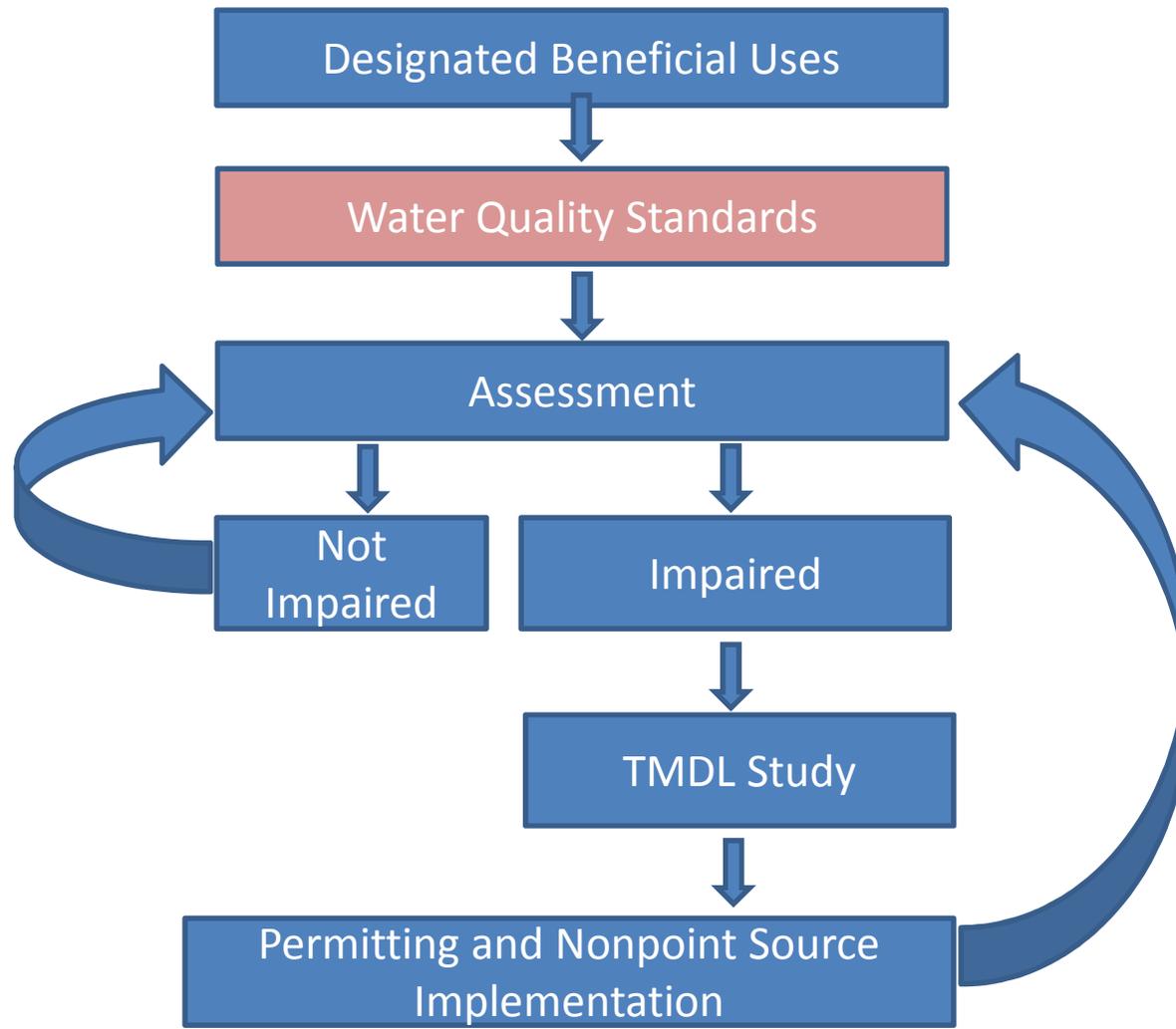
- All waters not specifically classified are presumptively classified: 2B, 3D

All irrigation canals and ditches statewide, except as otherwise designated: 2B, 3E, 4 (Section 13.9)

All drainage canals and ditches statewide, except as otherwise designated: 2B, 3E (Section 13.10)



Water Quality Standards



Narrative Standards R317-2-7.2

“It shall be unlawful, and a violation of these rules, for any person to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste; or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures; or determined by biological assessments in Subsection R317-2-7.3.”



Application of Standards (R317-2-7.1)

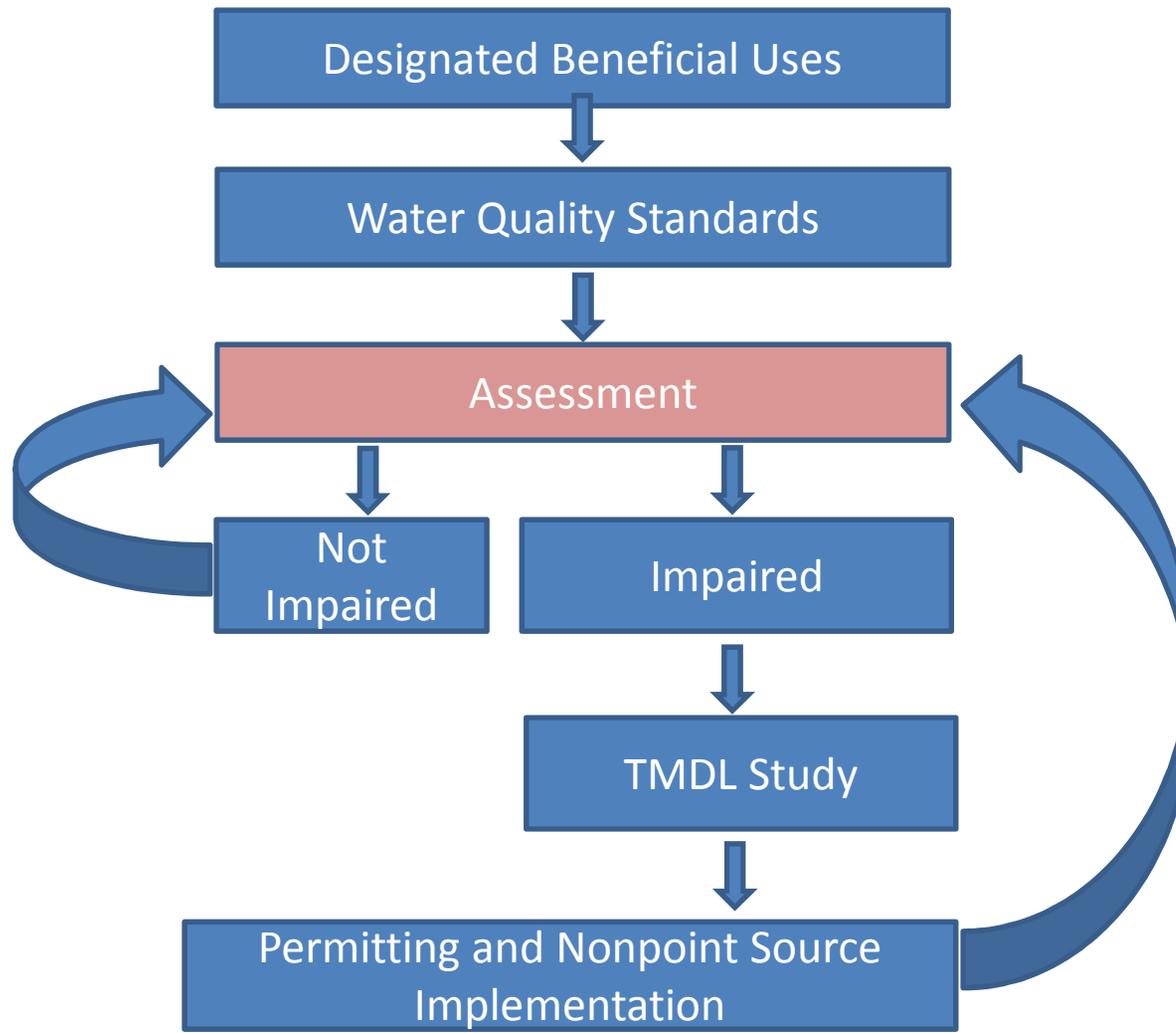
The numeric criteria listed in R317-2-14 shall apply to each of the classes assigned to waters of the State as specified in R317-2-6.

Unlawful and a violation of these rules for any person to discharge any wastes or substance

- in a manner that interferes with designated uses protected by assigned classes
- or to cause any of the applicable standards to be violated (except as provided in R317-1-3.1)



Assessment



Monitoring and Assessment

Strategic Monitoring Plan

- Monitoring design and objectives
 - Assessment, compliance, enforcement TMDL, nonpoint source, etc.
- Rotating Basin Approach
 - 6-year rotating basin design

Assessment and Reporting

- Clean Water Act (CWA) Sections 305(b) and 303 (d)
- Reported every other year
- 303(d) list to prioritize Total Maximum Daily Loads (TMDLs)



...In the Context of Utah Lake



Utah Lake Designated Beneficial Uses

2B: Protected for infrequent primary contact recreation.

3B: Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.

3D: Protected for waterfowl, shore birds and other water-oriented wildlife, including the necessary aquatic organisms in their food chain.

4: Protected for agricultural uses including irrigation of crops and stock watering.

**Utah Lake is NOT designated as Class 1C
(Source of domestic drinking water)**



Class 2 Recreational Use Designations

Class 2A -- Protected for **frequent** primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water. Examples include, but are not limited to, swimming, rafting, kayaking, diving, and water skiing.



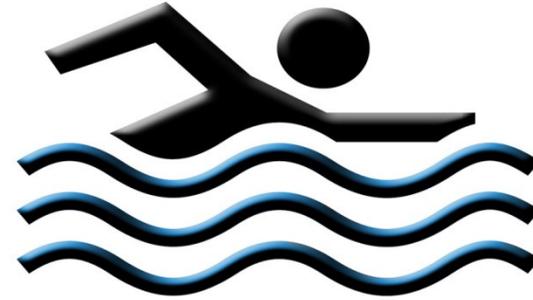
Class 2B -- Protected for **infrequent** primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.



Utah's Numeric Criteria Class 2 (R317-2-14)

Class 2 recreational use

- pH, E. coli., and turbidity criteria
- E. coli. criteria more stringent for frequent vs. infrequent recreation.
- N and P indicator criteria.



Class 3 Aquatic Life Use Designations

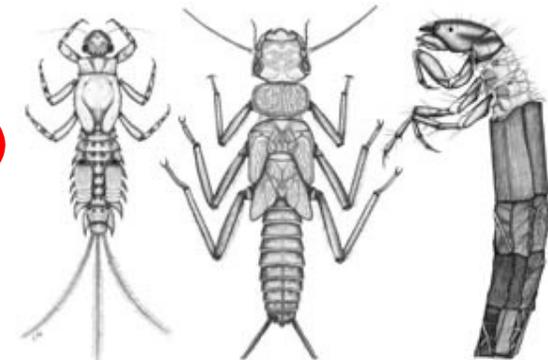
Class 3A -- Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.



Class 3B -- Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.

Class 3C -- Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.

Class 3D -- Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.



Class 3E -- Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.

Utah's Numeric Criteria Class 3 (R317-2-14)

Metals

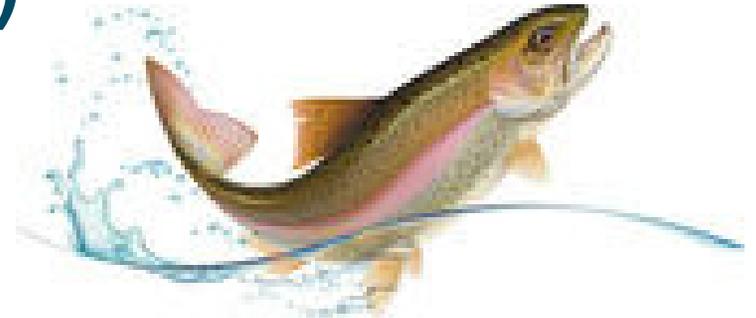
- Identical for Classes 3A-3D

Aquatic life criteria also include concentrations in water that are protective for human fish consumption

Temperature and dissolved oxygen criteria defined by specific Class 3 use

- Class 3A vs. Class 3D

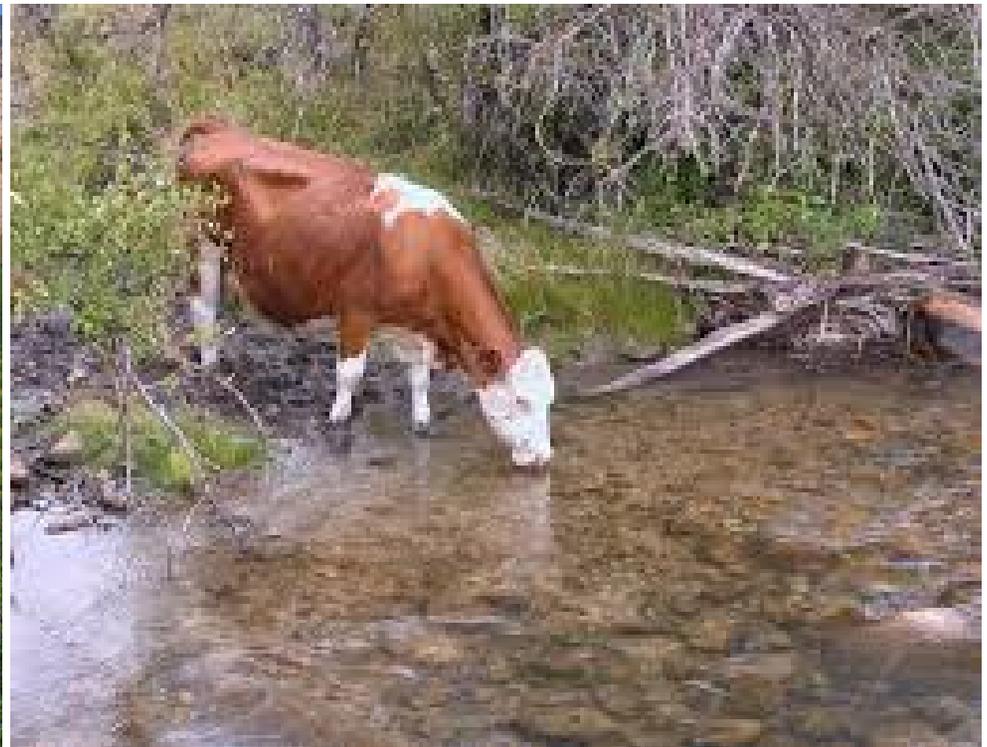
Ammonia criteria dependent on water temperature and pH



Class 4 Agriculture Use Designations

Class 4 -- Protected for agricultural

- Irrigation of crops
- Stock watering



Utah's Class 4 Numeric Criteria (R317-2-14)

Class 4 agricultural numeric criteria

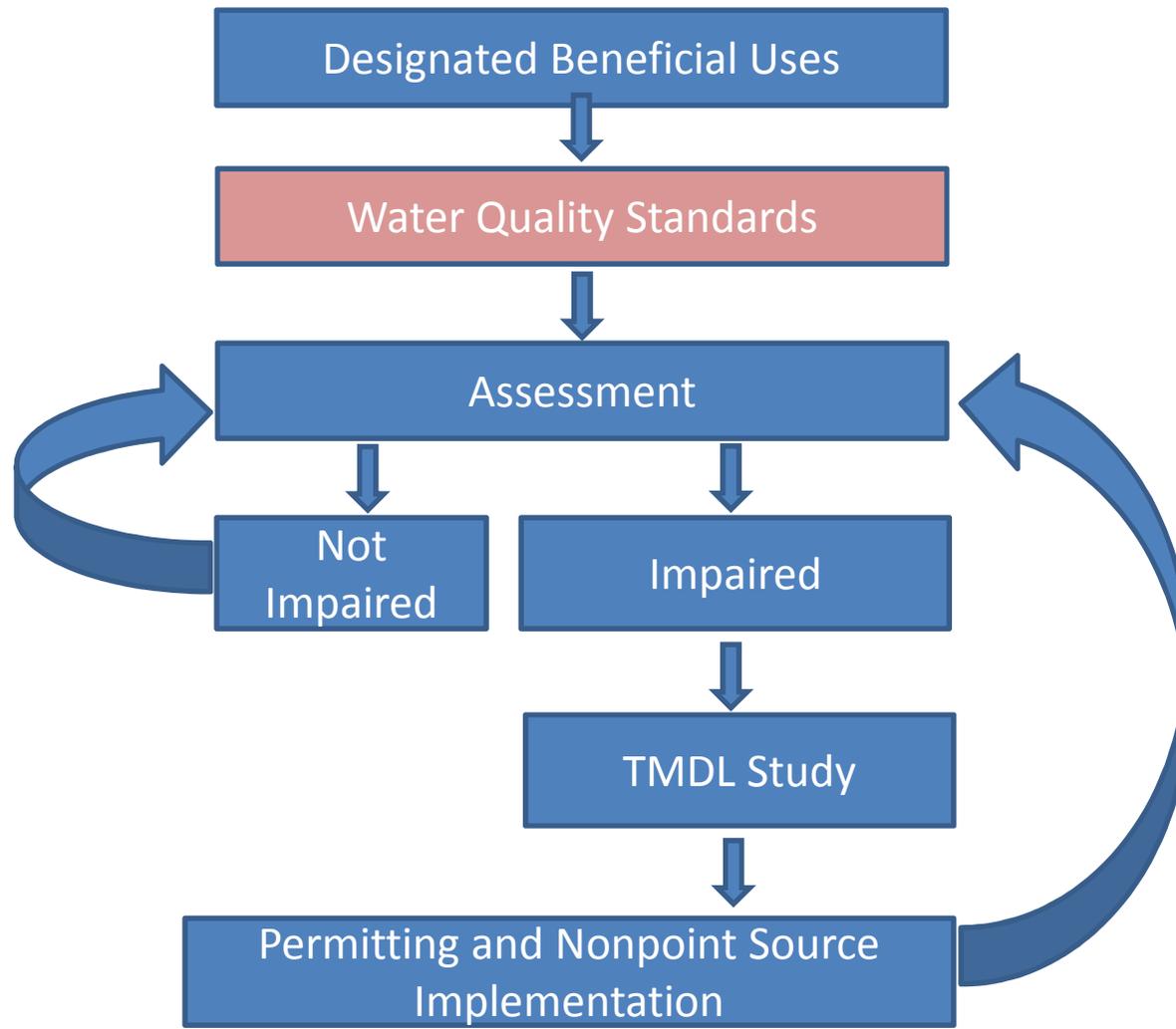
- Arsenic, Cadmium, Chromium, Copper, Lead, etc.
- Selenium, Boron
- Total Dissolved Solids (salts)



Utah's Strategy for Developing Nutrient Criteria



Water Quality Standards



Nutrient Pollution Threatens Utah Waters



Aquatic life



Aesthetics



Livestock



Recreation



Drinking Water

Direct toxicity

- High levels of nitrate cause blue baby syndrome.
- Ammonia is directly toxic to aquatic life.
- Cyanotoxins (Harmful Algal Blooms)

Indirect effects

- In excess, robs waters of dissolved oxygen
- Results in nuisance conditions
- Affects taste and odor of drinking water

Utah's Nutrient Reduction Strategy



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 16 2011

OFFICE OF
WATER

MEMORANDUM

SUBJECT: Working in Partnership with States to Address Phosphorus and Nitrogen Pollution through Use of a Framework for State Nutrient Reductions

FROM: Nancy K. Stoner
Acting Assistant Administrator 

TO: Regional Administrators, Regions 1-10

This memorandum reaffirms EPA's commitment to partnering with states and collaborating with stakeholders to make greater progress in accelerating the reduction of nitrogen and phosphorus loadings to our nation's waters. The memorandum synthesizes key principles that are guiding and that have guided Agency technical assistance and collaboration with states and urges the Regions to place new emphasis on working with states to achieve near-term reductions in nutrient loadings.

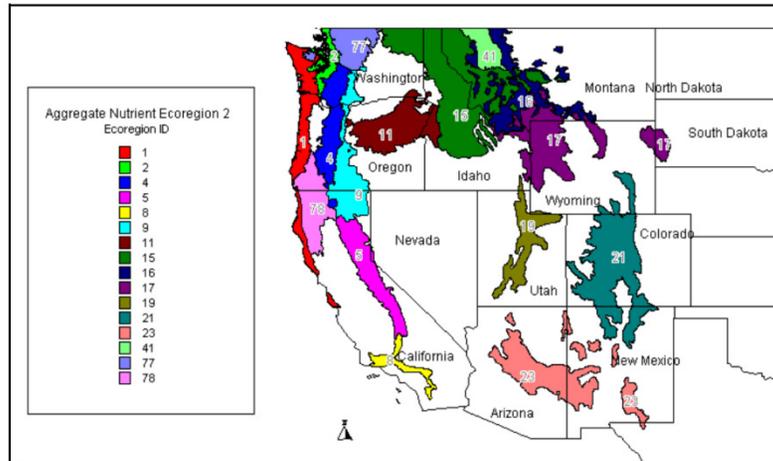
Over the last 50 years, as you know, the amount of nitrogen and phosphorus pollution entering our waters has escalated dramatically. The degradation of drinking and environmental water quality associated with excess levels of nitrogen and phosphorus in our nation's water has been studied and documented extensively, including in a recent joint report by a Task Group of senior state and EPA water quality and drinking water officials and managers.¹ As the Task Group report outlines, with U.S. population growth, nitrogen and phosphorus pollution from urban stormwater runoff, municipal wastewater discharges, air deposition, and agricultural livestock activities and row crop runoff is expected to grow as well. Nitrogen and phosphorus pollution has the potential to become one of the costliest and the most challenging environmental problems we face. A few examples of this trend include the following:

- 1) 50 percent of U.S. streams have medium to high levels of nitrogen and phosphorus.
- 2) 78 percent of assessed coastal waters exhibit eutrophication.
- 3) Nitrate drinking water violations have doubled in eight years.

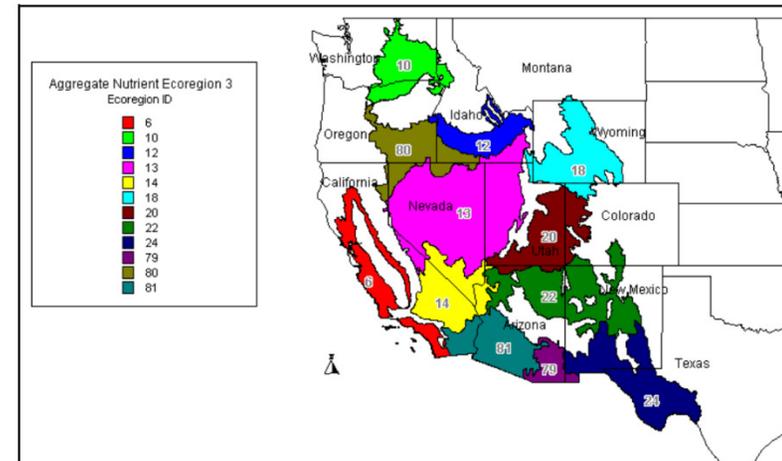


EPA's Nutrient Criteria: 2002 - 2004

Western Forested Ecoregion (II)



Xeric West Ecoregion (III)



	Rivers and Streams		Lakes and Reservoirs	
	TP (mg/L)	TN (mg/L)	TP (mg/L)	TN (mg/L)
Western Forested Ecoregions (II) <i>Wasatch and Uintah Mountains (19)</i>	0.01	0.34	0.005	0.21
Xeric West Ecoregion (II) <i>Central Basin and Range Subcoregion (13)</i>	0.028	0.425	0.03	0.51
Xeric West Ecoregion (II) <i>Colorado Plateaus Subcoregion (20)</i>	0.02	0.553	0.003	0.15



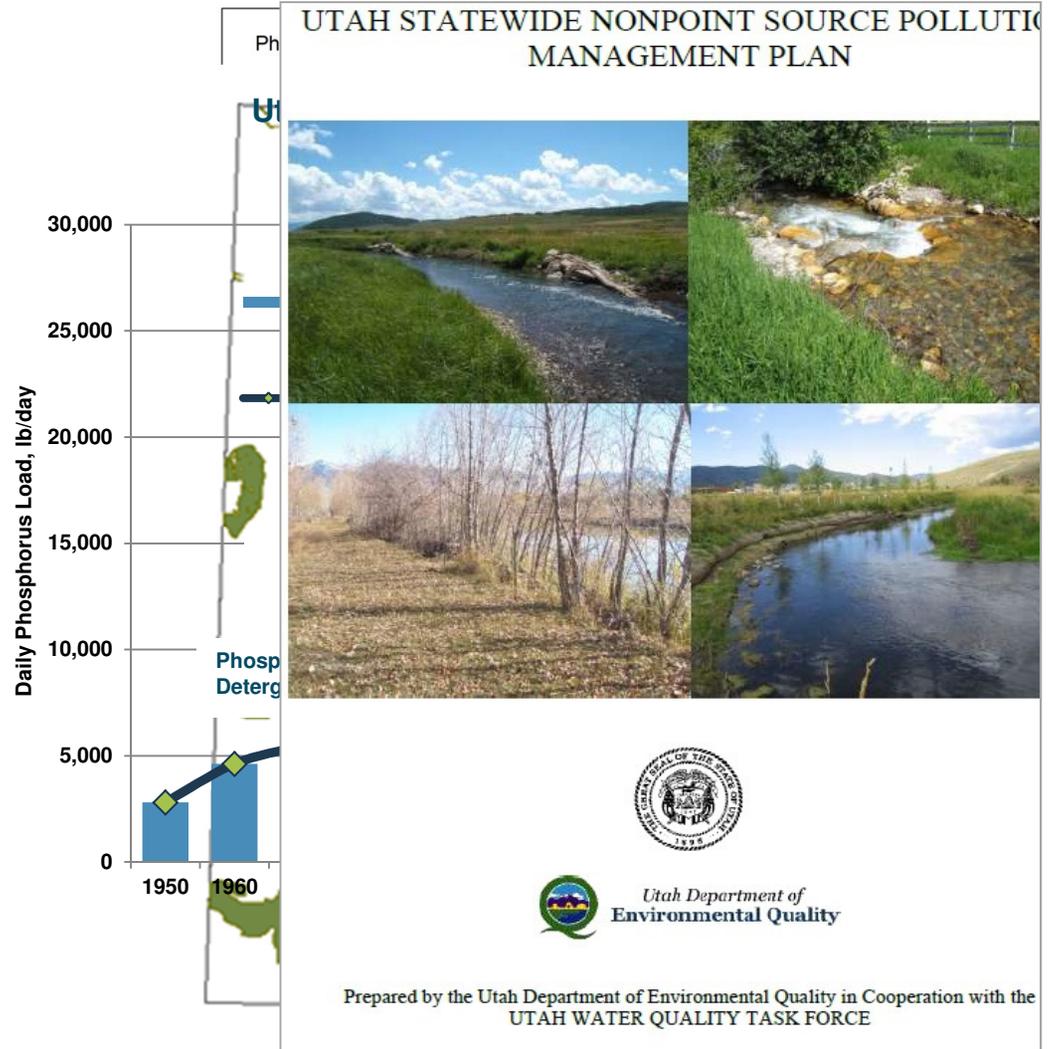
Utah's Nutrient Strategy

“Hold the Line” state-wide on nutrients with Technology Based Phosphorus Effluent Limit of 1 mg/L by 1/1/2020

Headwater Numeric Nutrient Criteria to protect pristine waters

Develop site-specific nutrient standards for major waters

Continue nonpoint source project implementation



Nutrient Related Studies in Utah

- ❑ [Nutrient Ecological Study](#) aimed at evaluating the ecological impacts of nutrient additions on the state's rivers and streams.
- ❑ [Economics Benefits Study](#) that quantifies the economics benefits of implementing nutrient reductions to surface waters in Utah.
- ❑ [POTW Nutrient Removal Cost Impact Study](#) in which the costs of removing nutrients to varying degrees was calculated for each mechanical Publicly Owned Treatment Works in the state, in collaboration with operators and general managers for each system.
- ❑ [Technical Basis for Utah's Nutrient Strategy](#) that provides the scientific basis for the development of numeric nutrient criteria for Utah's headwater streams.
- ❑ [Willard Spur](#) studies to evaluate the effects of nutrient loading on the unique ecosystem of Willard Spur.
- ❑ Total Maximum Daily Load studies for [Deer Creek Reservoir](#), [Jordanelle Reservoir](#), [Rockport and Echo Reservoirs](#), [Cutler Reservoir](#), [Middle Bear River](#), [Lower Bear River](#), [Newcastle Reservoir](#), [East Canyon Creek and Reservoir](#), and [Pineview Reservoir](#), among others.
- ❑ Preliminary total maximum daily load studies on [Utah Lake](#).



Overview of Why We're Here Part I

Discussion

